



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/811,133

03/26/2004

Ralf Kruckel

ANO 6295 US/0606

2794

27624

7590

12/15/2008

AKZO NOBEL INC.

LEGAL & IP

120 WHITE PLAINS ROAD, SUITE 300

TARRYTOWN, NY 10591

EXAMINER

CORDRAY, DENNIS R

ART UNIT

PAPER NUMBER

1791

MAIL DATE

DELIVERY MODE

12/15/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

Response to Arguments

Applicant's amendments, filed 10/14/2008, have overcome the rejection as currently formulated. Therefore the rejections have been withdrawn. However, due to the amendments and upon further consideration, a new ground of rejection is made in view of Frolich et al, Dilts et al and Wendel et al.

Applicant's arguments regarding Frolich et al and Wendel et al are discussed below.

Applicant argues that Frolich et al disclose any number of different emulsifiers and do not disclose the claimed emulsifier. Applicant also argues that Wendel et al disclose any number of emulsifiers and do not disclose or suggest a combination of the claimed cellulose reactive sizing agent and a cellulose non-reactive sizing agent. Wendel et al also prefer a cationic emulsifier. Applicant further argues that Holmberg et al do not disclose the claimed mixture of sizing agents or the claimed emulsifier.

With respect to combining the references, Applicant argues that one skilled in the art would have no reason to combine their teachings, that one would have to pick and choose from them to select the claimed emulsifier absent any teaching or suggestion to do so, and that there is no teaching or suggestion of the advantages of the claimed invention or reason to expect the advantages.

Frolich et al disclose, in some embodiments, a size dispersion comprising alkyl ketene dimer (AKD) and a non-cellulose-reactive sizing agent and that that preferred hydrophobically modified dispersing agents comprise sulfate groups and carboxylic,

Art Unit: 1791

sulfonic, phosphoric and phosphonic acid groups present as free acid or water soluble salts (e.g.-phosphates) (col 3, lines 45-55). In addition the claimed phosphate containing emulsifiers are well known in the art for use with AKD sizing compositions, as discussed in the rejections herein.

With regard to Wendel et al, the intent is not to shift the burden on Applicants to provide reasons why one would not select a particular emulsifier. Although Wendel et al prefer a cationic emulsifier, the reference does not discourage or teach against using an anionic emulsifier. Instead, Wendel et al disclose that conventional (well known in the art) cationic, amphoteric or anionic surfactants can be used. Suitable conventional anionic surfactants include alkyl sulfates, alkyl-sulfonates and alkyl phosphates, which may also be in the form of adducts with ethylene oxide (col 5, lines 2-15). The disclosed anionic surfactants overlap those claimed in the instant application.

The combination of the references is discussed in the rejections.

Holmberg et al is not used in the current rejections.

Regarding the expectation of the advantages of the instant invention, the reason or motivation to modify the reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by applicant. >See, e.g., *In re Kahn*, 441 F.3d 977, 987, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006) (motivation question arises in the context of the general problem confronting the inventor rather than the specific problem solved by the invention); *Cross Med. Prods., Inc. v. Medtronic Sofamor Danek, Inc.*, 424 F.3d 1293, 1323, 76 USPQ2d 1662, 1685

(Fed. Cir. 2005) (“One of ordinary skill in the art need not see the identical problem addressed in a prior art reference to be motivated to apply its teachings.”)

Regarding the data in support of the claimed invention, Examples 1 and 2 compare a specific mixture of commercially available sizing agents, a cationic compound, an anionic compound and a phosphate ester, each falling within the claimed limitations, with either of a commercially available AKD based size or a commercially available poly(styrene/acrylic ester) composition. The emulsifiers or stabilizers in the commercial products are unknown. Example 3 compares the stability of a different mixture of the above ingredients with and without the claimed emulsifier. No other emulsifiers are tested and one of ordinary skill in the art would expect a composition comprising no emulsifier to be less stable. Example 4 compares changes in particle size in the composition similar to that of Example 1 with changes in the amount of cationic and anionic compounds. Example 4 has nothing to do with supporting the claimed emulsifier. In contrast, the claimed invention embodies a sizing composition comprising any AKD, any copolymer containing styrene and another ethylenically unsaturated monomer, a broadly claimed oxyalkylene phosphate ester, with the three ingredients mixed in any relative amounts. In addition, the composition can comprise any amount of a broad variety of quaternary ammonium compounds and any amount of condensed naphthalene and/or lignin sulfonates. The compositions can be applied in any amount in sizing pulp or paper. The specific examples are not commensurate in scope with the claims.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-3, 5 and 8-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frolich et al (6306255) in view of Dilts et al (6576049) and further in view of Wendel et al (4051093).

Claims 1, 5, 8 and 22: Frolich et al disclose an aqueous dispersion for paper sizing comprising a cellulose-reactive sizing agent, most preferably a ketene dimer (AKD), a non-cellulose reactive sizing agent, and a hydrophobically modified dispersing agent that is preferably anionic and contains sulfate, sulfonic, phosphate or phosphonic acid groups (Abs; col 2, lines 49-56; col 3, lines 22-24 and 45-55). The sizing dispersion can be used for surface or internal sizing (col 9, lines 1-4).

Frolich et al do not disclose the claimed emulsifier. Frolich et al do not disclose a non-reactive size comprising styrene or alkyl esters of (meth)acrylic acid.

Dilts et al disclose sizing compositions for paper comprising AKD, an emulsion stabilizer and from about 0.01% to about 15% by weight of the sizing agent of a hydrophobic substance (Abs; col 2, lines 54-60). The hydrophobic substance increases sizing efficiency of the sizing agent (col 2, lines 45-49). Suitable emulsifiers for the composition are well known in the art and include ethoxylated phosphate esters (col 14, lines 46-48 and 63-67; col 15, lines 1-3). The emulsion stabilizer can be a cationic polymer or starch (col 3, lines 21-23). Note that Frolich et al teach that AKD dispersions are usually prepared with the aid of an anionic compound (e.g.-sodium lignosulfonate)

Art Unit: 1791

in combination with a high molecular weight cationic starch or polymer (Frolich et al, col 1, lines 13-27).

Frolich et al and Dilts et al do not disclose a non-reactive size comprising styrene or alkyl esters of (meth)acrylic acid.

Wendel et al disclose a paper sizing composition comprising a copolymer emulsion and an anionic, nonionic or cationic emulsifier. The non-reactive copolymer sizing agent comprises:

- (A) from 0.5 to 15 per cent by weight of monomers containing a polymerizable C=C bond and at least one carboxyl and/or sulfonic acid or phosphate or phosphite group,
- (B) from 5 to 30 per cent by weight of monomers containing a C=C bond and a tertiary or quaternary amino group, or a nitrogen-containing heterocyclic group,
- (C) from 0 to 94.5 per cent by weight of styrene and/or acrylonitrile
- (D) from 0 to 94.5 per cent by weight of acrylic or methacrylic acid esters of alkanols of 1 to 8 carbon atoms, and
- (E) from 0 to 30 per cent by weight of further olefinically unsaturated monomers.

The amount of monomers C and D is at least 25%, preferably at least 70%, and up to 94.5% by weight of the polymer. Wendel et al disclose that preferred (meth)acrylic acid esters are methyl (meth)acrylates, ethyl (meth)acrylates, n-propyl (meth)acrylates, n-butyl (meth)acrylates and isobutyl (meth)acrylates (Abs; col 1, lines 33-34; col 2, lines 8-49, particularly lines 44-49; col 4, lines 63-65; col 5, lines 12-15).

Art Unit: 1791

Thus, in some embodiments, the polymer of Wendel et al comprises 94.5% styrene and alkyl (meth)acrylates, the remainder being other ethylenically unsaturated monomers.

Note that the instant claim language allows for additional species of ethylenically unsaturated monomers. Wendel et al recite suitable anionic emulsifiers for use in the sizing emulsion are conventional anionic alkyl sulfates, alkyl sulfonates and alkyl phosphates that can be in the form of adducts of ethylene oxide (oxyalkylene phosphate esters).

The art of Frolich et al, Dilts et al, Wendel et al and the instant invention is analogous as pertaining to sizing dispersions for paper. Absent convincing evidence of unexpected results, it would have been obvious to one of ordinary skill in the art to use the claimed styrene and alkyl (meth)acrylate copolymers as the non-cellulose-reactive sizing agent in the composition and method of Frolich et al in view of Dilts et al and further in view of Wendel et al or, alternatively, to form mixtures of the dispersions of Frolich et al and Wendel et al to also be used for sizing paper as functionally equivalent compositions and to optimize the mixed compositions. "It is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art." In re Kerkhoven, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980) (citations omitted).

Frolich et al prefer hydrophobically modified anionic surfactants comprising sulfates and phosphates for mixtures of AKD and a non-cellulose-reactive size. Dilts et

Art Unit: 1791

al disclose that the claimed emulsifiers are well known in the art and are used for AKD sizing compositions. Wendel et al teach that the claimed surfactants are conventionally known and are suitable for the disclosed polymeric non-cellulose-reactive sizes. It would have been obvious to use the claimed emulsifier in the dispersion of Frolich et al in view of Dilts et al and further in view of Wendel et al as a conventionally known emulsifier and as a functionally equivalent option, and to have a reasonable expectation of success, the emulsifier being disclosed in the prior art as suitable for AKD and the claimed polymeric non-cellulose-reactive size.

The aqueous sizing dispersion so made is substantially the same as the claimed dispersion and has the claimed stability properties because, where the claimed and prior art apparatus or product are identical or substantially identical in structure or composition, a *prima facie* case of obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). In other words, when the structure recited in the reference is substantially identical to that of the claims, the claimed properties or functions are presumed to be inherent.

Claims 2 and 9: Frolich discloses the presence of a surfactant of the general formula $R_4N^+X^-$, each R is independently H or a hydrocarbon group having from 1 to 30 carbon atoms, and X^- is an anion (col 4, lines 35-50 and 60). The disclosed list of examples of surfactants is almost identical to the list of examples recited in the instant Disclosure on p 5, lines 8-15, and thus meets the claimed molecular weight.

Claims 3 and 10: The anionic emulsifier is an anionic stabilizer. Alternatively, Frolich et al teaches that alkyl ketene dimers are usually prepared using a sodium

Art Unit: 1791

lignosulfate (a lignin sulfonate) (col 1, lines 21-24), thus it would have been obvious to one of ordinary skill in the art to include a typical dispersant used with alkyl ketene dimers.

Claims 11-12: Frolich et al discloses a preferred embodiment wherein the dispersion is anionic (col 6, lines 54-59). Examples are given showing better performance when the dispersion is anionic (col 9, line 26 to col 10, line 27, especially col 10, lines 25-27). Example 1 also discloses a pH for the dispersion of 5 (col 9, lines 34-35). Wendel et al discloses that the emulsions are stable at a pH from 2 to 12 (col 5, line 68 to col 6, line 3).

Claims 13-16: Frolich et al and Wendel et al are applied as in claims 1-3, 5 and 8-10 above. With regard to Claim 14, Frolich discloses that the dispersant is made hydrophobic by attaching one or more hydrophobic chains having from 4 to 30 carbon atoms (col 3, lines 29-36). Wendel et al discloses alkyl sulfates, alkyl sulfonates and alkyl phosphates that can be in the form of adducts of ethylene oxide without specifying the number of oxyethylene (ethylene oxide) units. However, other ethoxylated surfactants disclosed by Wendel et al comprise chains of 7 to 50 oxyethylene units with a long chain alcohol to form a hydrophobic portion (col 5, lines 8-10). It would have been obvious to one of ordinary skill in the art to include the claimed number of oxyethylene units in the dispersants as a range typically used for such dispersants.

Claims 17, 18 and 21: Frolich discloses bringing together the components of the dispersion and homogenizing the mixture to obtain an aqueous dispersion (col 7, lines

Art Unit: 1791

62-66). Wendel et al discloses that the emulsifiers form a homogeneous mixture in water (col 5, lines 7-9).

Claims 19-20: The processes of forming a paper web from a stock containing cellulosic fibers and dewatering on a wire to obtain a paper and white water are standard papermaking procedures and would have been obvious to one of ordinary skill in the art. Addition of the sizing dispersion to the stock or to a paper surface is disclosed by Frolich et al (col 9, lines 4-10).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Art Unit: 1791

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DENNIS CORDRAY whose telephone number is (571)272-8244. The examiner can normally be reached on M - F, 7:30 -4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dennis Cordray/
Examiner, Art Unit 1791

/Eric Hug/
Primary Examiner, Art Unit 1791